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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/678,989	10/02/2003	Gi Youl Kim	PA2625US	1554

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EXAMINER

ZERVIGON, RUDY

ART UNIT	PAPER NUMBER
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1763

DATE MAILED: 01/11/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/678,989

Applicant(s)

KIM ET AL.

Examiner

Rudy Zervigon

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 October 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) 17-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16 and 21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
2. Claims 1-16, and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over van Os; Ron et al. (US 5,792,272 A) in view of Muruges; Laxman et al. (US 6,450,117 B1). van Os teaches a deposition system (column 2; lines 10-15) comprising: a cleaning gas (column 4, lines 18-31) configured to generate a reactive cleaning gas (column 4, lines 18-31); and a deposition chamber (16; Figure 1; column 3, lines 30-56) including a processing gas shower (15; Figure 1; column 3, lines 30-56), a cleaning gas (column 4, lines 18-31) distribution channel (54, 56; Figure 4; column 7, lines 18-31) separate from the processing gas shower (15; Figure 1; column 3, lines 30-56), and a plurality of cleaning gas injection ports (44a,b; Figure 4; column 7, lines 18-31) fluidly connected to the cleaning gas (column 4, lines 18-31) distribution channel (54, 56; Figure 4; column 7, lines 18-31) and disposed to introduce the cleaning gas (column 4, lines 18-31) into an interior of the deposition chamber (16; Figure 1; column 3, lines 30-56) – claim 1
van Os further teaches:
 - i. The deposition system (column 2; lines 10-15) of claim 1, wherein the cleaning gas (column 4, lines 18-31) distribution channel (54, 56; Figure 4; column 7, lines 18-31) and plurality of cleaning gas injection ports (44a,b; Figure 4; column 7, lines 18-31) are disposed within a lid (piece between 12 and 17, not labeled; Figure 2) of the deposition chamber (16; Figure 1; column 3, lines 30-56) - claim 2

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- ii. The deposition system (column 2; lines 10-15) of claim 1, wherein the cleaning gas (column 4, lines 18-31) source is configured to generate reactive fluorine species - claim 3
- iii. The deposition system (column 2; lines 10-15) of claim 1, wherein the cleaning gas (column 4, lines 18-31) source is configured to generate a reactive cleaning gas (column 4, lines 18-31) for cleaning by products of WSi_x film generation - claim 4. Applicant's claim requirements of "for cleaning by products of WSi_x film generation" is a recitation of intended use of the pending apparatus claims. Further, it has been held that claim language that simply specifies an intended use or field of use for the invention generally will not limit the scope of a claim (Walter , 618 F.2d at 769, 205 USPQ at 409; MPEP 2106). Additionally, in apparatus claims, intended use must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim (In re Casey, 152 USPQ 235 (CCPA 1967); In re Otto , 136 USPQ 458, 459 (CCPA 1963); MPEP2111.02).
- iv. The deposition system (column 2; lines 10-15) of claim 1, wherein the plurality of cleaning gas injection ports (44a,b; Figure 4; column 7, lines 18-31) include a first subset of the plurality of cleaning gas injection ports (44a,b; Figure 4; column 7, lines 18-31) disposed at a first angle (column 7, lines 48-56) relative to side walls (70; Figure 4) of the deposition chamber (16; Figure 1; column 3, lines 30-56), and a second subset of the plurality of cleaning gas injection ports (44a,b; Figure 4; column 7, lines 18-31) disposed

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- at a second angle (column 7, lines 48-56) relative to the side walls (70; Figure 4) - claim 5
- v. The deposition system (column 2; lines 10-15) of claim 1, wherein the plurality of cleaning gas injection ports (44a,b; Figure 4; column 7, lines 18-31) are distributed along an interior rim (40; Figure 4) of a lid (piece between 12 and 17, not labeled; Figure 2) of the deposition chamber (16; Figure 1; column 3, lines 30-56) - claim 6
- vi. The deposition system (column 2; lines 10-15) of claim 1, further including internal plumbing (46,48; Figure 4; column 7, lines 18-31) configured to transport the reactive cleaning gas (column 4, lines 18-31) to the cleaning gas (column 4, lines 18-31) distribution channel (54, 56; Figure 4; column 7, lines 18-31), the internal plumbing (46,48; Figure 4; column 7, lines 18-31) being disposed within a wall of the deposition chamber (16; Figure 1; column 3, lines 30-56) - claim 7
- vii. The deposition system (column 2; lines 10-15) of claim 1, further including a plurality of channel openings (baffle plate 62; Figure 4; column 7, lines 18-31) configured for reactive cleaning gas (column 4, lines 18-31) to enter the cleaning gas (column 4, lines 18-31) distribution channel (54, 56; Figure 4; column 7, lines 18-31) - claim 8
- viii. The deposition system (column 2; lines 10-15) of claim 1, further including a chamber collar (40; Figure 4) configured to separate a lid (piece between 12 and 17, not labeled; Figure 2) of the deposition chamber (16; Figure 1; column 3, lines 30-56) from walls (70; Figure 4) of the deposition chamber (16; Figure 1; column 3, lines 30-56), the chamber collar (40; Figure 4) including internal plumbing (46,48; Figure 4; column 7, lines 18-31) configured to supply reactive cleaning gas (column 4, lines 18-31) to the cleaning gas

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- (column 4, lines 18-31) distribution channel (54, 56; Figure 4; column 7, lines 18-31) – claim 9
- ix. The deposition system (column 2; lines 10-15) of claim 1, wherein the plurality of cleaning gas injection ports (44a,b; Figure 4; column 7, lines 18-31) are configured to deliver a greater concentration of reactive cleaning gases (column 4, lines 18-31) to a cooler region of a deposition chamber (16; Figure 1; column 3, lines 30-56) than to a warmer region of the deposition chamber (16; Figure 1; column 3, lines 30-56) – claim 10. Applicant's claim limitation is a recitation of intended use of the pending apparatus claims. Further, it has been held that claim language that simply specifies an intended use or field of use for the invention generally will not limit the scope of a claim (Walter , 618 F.2d at 769, 205 USPQ at 409; MPEP 2106). Additionally, in apparatus claims, intended use must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim (In re Casey, 152 USPQ 235 (CCPA 1967); In re Otto , 136 USPQ 458, 459 (CCPA 1963); MPEP 2111.02).
- x. A deposition chamber (16; Figure 1; column 3, lines 30-56) lid (piece between 12 and 17, not labeled; Figure 2) comprising: a cleaning gas (column 4, lines 18-31) distribution channel (54, 56; Figure 4; column 7, lines 18-31) disposed within a perimeter of the deposition chamber (16; Figure 1; column 3, lines 30-56) lid (piece between 12 and 17, not labeled; Figure 2) and configured to circulate a reactive cleaning gas (column 4, lines 18-31); a plurality of cleaning gas injection ports (44a,b; Figure 4; column 7, lines 18-31)

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configured to deliver the reactive cleaning gas (column 4, lines 18-31) from the cleaning gas (column 4, lines 18-31) distribution channel (54, 56; Figure 4; column 7, lines 18-31) to an interior of a deposition chamber (16; Figure 1; column 3, lines 30-56), the cleaning gas injection ports (44a,b; Figure 4; column 7, lines 18-31) distributed around the deposition chamber (16; Figure 1; column 3, lines 30-56) lid (piece between 12 and 17, not labeled; Figure 2) and configured to deliver a greater concentration of the reactive cleaning gas (column 4, lines 18-31) to an upper region of the deposition chamber (16; Figure 1; column 3, lines 30-56) than to a lower region of the deposition chamber (16; Figure 1; column 3, lines 30-56); and internal plumbing (46,48; Figure 4; column 7, lines 18-31) configured to supply the reactive cleaning gas (column 4, lines 18-31) to the cleaning gas (column 4, lines 18-31) distribution channel (54, 56; Figure 4; column 7, lines 18-31) – claim 11. Applicant's claim requirement of "and configured to deliver a greater concentration of the reactive cleaning gas to an upper region of the deposition chamber than to a lower region of the deposition chamber" is a claim requirement of intended use of the pending apparatus claims. Further, it has been held that claim language that simply specifies an intended use or field of use for the invention generally will not limit the scope of a claim (Walter , 618 F.2d at 769, 205 USPQ at 409; MPEP 2106). Additionally, in apparatus claims, intended use must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim (In re Casey, 152 USPQ 235 (CCPA 1967); In re Otto , 136 USPQ 458, 459 (CCPA 1963); MPEP2111.02).

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- xi. The deposition chamber (16; Figure 1; column 3, lines 30-56) lid (piece between 12 and 17, not labeled; Figure 2) of claim 11, further including a lid (piece between 12 and 17, not labeled; Figure 2) section configured to support a processing gas shower (15; Figure 1; column 3, lines 30-56), the processing gas shower (15; Figure 1; column 3, lines 30-56) being separate from the cleaning gas (column 4, lines 18-31) distribution channel (54, 56; Figure 4; column 7, lines 18-31) – claim 12
- xii. The deposition chamber (16; Figure 1; column 3, lines 30-56) lid (piece between 12 and 17, not labeled; Figure 2) of claim 11, further including a processing gas shower (15; Figure 1; column 3, lines 30-56) separate from the internal plumbing (46,48; Figure 4; column 7, lines 18-31) – claim 13
- xiii. The deposition chamber (16; Figure 1; column 3, lines 30-56) lid (piece between 12 and 17, not labeled; Figure 2) of claim 11, wherein the plurality of cleaning gas injection ports (44a,b; Figure 4; column 7, lines 18-31) include a first subset of the plurality of cleaning gas injection ports (44a,b; Figure 4; column 7, lines 18-31) disposed at a first angle (column 7, lines 48-56) relative to an edge of the deposition chamber (16; Figure 1; column 3, lines 30-56) lid (piece between 12 and 17, not labeled; Figure 2), and a second subset of the plurality of cleaning gas injection ports (44a,b; Figure 4; column 7, lines 18-31) disposed at a second angle (column 7, lines 48-56) relative to the edge – claim 14
- xiv. The deposition chamber (16; Figure 1; column 3, lines 30-56) lid (piece between 12 and 17, not labeled; Figure 2) of claim 11, wherein the plurality of cleaning gas injection ports (44a,b; Figure 4; column 7, lines 18-31) are configured to deliver a greater concentration of reactive cleaning gases (column 4, lines 18-31) to a cooler region of a

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deposition chamber (16; Figure 1; column 3, lines 30-56) than to a warmer region of the deposition chamber (16; Figure 1; column 3, lines 30-56) – claim 16. Applicant's claim limitation is a recitation of intended use of the pending apparatus claims. Further, it has been held that claim language that simply specifies an intended use or field of use for the invention generally will not limit the scope of a claim (Walter , 618 F.2d at 769, 205 USPQ at 409; MPEP 2106). Additionally, in apparatus claims, intended use must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim (In re Casey, 152 USPQ 235 (CCPA 1967); In re Otto , 136 USPQ 458, 459 (CCPA 1963); MPEP 2111.02).

- xv. A deposition system (column 2; lines 10-15) comprising: equivalent means for (see above) transporting a reactive cleaning gas (column 4, lines 18-31) to a cleaning gas (column 4, lines 18-31) distribution channel (54, 56; Figure 4; column 7, lines 18-31) disposed in a lid (piece between 12 and 17, not labeled; Figure 2) of the deposition chamber (16; Figure 1; column 3, lines 30-56); equivalent means for (see above) circulating the reactive cleaning gas (column 4, lines 18-31) around a perimeter of the lid (piece between 12 and 17, not labeled; Figure 2); equivalent means for (see above) passing the reactive cleaning gas (column 4, lines 18-31) into the interior of the deposition chamber (16; Figure 1; column 3, lines 30-56); and equivalent means for (see above) generating a desired concentration gradient of the reactive cleaning gas (column 4, lines 18-31) in the deposition chamber (16; Figure 1; column 3, lines 30-56), the desired concentration gradient including a greater concentration near cooler elements

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within the deposition chamber (16; Figure 1; column 3, lines 30-56) than near warmer elements – claim 21

van Os does not teach a “cleaning gas (column 4, lines 18-31) source”. Van Os further does not teach:

- i. The deposition chamber (16; Figure 1; column 3, lines 30-56) lid (piece between 12 and 17, not labeled; Figure 2) of claim 11, wherein the cleaning gas (column 4, lines 18-31) distribution channel (54, 56; Figure 4; column 7, lines 18-31) has a cross-section ten or more times greater than a cross-section of one of the plurality of cleaning gas injection ports (44a,b; Figure 4; column 7, lines 18-31) – claim 15

Murugesh teaches a deposition system (Figure 3) including a “cleaning gas source” (125, Figure 3).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to add Murugesh’s cleaning gas source and to optimize the relative dimension of van Os’s cleaning gas distribution channel (54, 56; Figure 4; column 7, lines 18-31) relative to van Os’s cleaning gas injection ports (44a,b; Figure 4; column 7, lines 18-31).

Motivation to add Murugesh’s cleaning gas source and to optimize the relative dimension of van Os’s cleaning gas distribution channel (54, 56; Figure 4; column 7, lines 18-31) relative to van Os’s cleaning gas injection ports (44a,b; Figure 4; column 7, lines 18-31) is to maintain the process cleaning gas within confines for delivery and to optimize the cleaning gas flow during process cleaning, respectively. It is well established that changes in apparatus dimensions are within the level of ordinary skill in the art. (Gardner v. TEC Systems, Inc., 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984); In re Rose, 220

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F.2d 459, 105 USPQ 237 (CCPA 1955); In re Rinehart, 531 F.2d 1048, 189 USPQ 143 (CCPA 1976); See MPEP 2144.04)

Response to Arguments

3. Applicant's arguments filed October 31, 2005 have been fully considered but they are not persuasive.

4. Applicant states:

“

With respect to claim 1 and its dependent claims, the recited feature of a cleaning gas distribution channel separate from the processing gas shower is not found in the cited references. The Office Action refers to gas injection manifold 15 in the apparatus described by van Os (col. 4, 11. 18-31), however, it is apparent from van Os' description that this same gas manifold is used as a processing gas delivery mechanism. See, e.g., col. 3, 11. 39-40: The first manifold 15 conveys at least one gaseous chemical to plasma chamber 18.: The same is true for gas manifold 17 (see, e.g., col. 4, 11. 4-7). Hence, because both of these gas delivery mechanisms are used to convey process gasses as well as cleaning gasses, neither can be said to be "separate" from the processing gas shower as recited in claim 1. Instead, gas manifolds 15 and 17 of van Os are both processing and cleaning gas delivery mechanisms. For at least these reasons claim 1 and its dependent claims are patentable over van Os.

“

Applicant's argument is not found persuasive. Applicant's process gas shower is shown as element 160; Figure 1. Applicant's cleaning gas distribution channel is shown as 120; Figure 1. It is clear from Applicant's application that said components are "separate". The Examiner has

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interpreted “separate” as within the scope of Applicant’s Figure 1 which shows said elements as functioning to deliver gases that are not mixed prior to introduction into Applicant’s reactor 140; Figure 1. The Examiner’s review of van Os and the Examiner’s citations of van Os’s cleaning gas (column 4, lines 18-31) distribution channel (54, 56; Figure 4; column 7, lines 18-31) separate from the processing gas shower (15; Figure 1; column 3, lines 30-56) meets Applicant’s claim limitations.

5. Applicant states:

“

With respect to claim 11 and its dependent claims, the recited features of cleaning gas injection ports distributed around the chemical vapor deposition chamber lid and configured to deliver a greater concentration of the reactive cleaning gas to an upper region of the chemical vapor deposition chamber than to a lower region of the chemical vapor deposition chamber is not found in the cited references. Contrary to the conclusion set forth in the office action, this claimed feature is not a recitation of a field of use.

“

In response, the Examiner asserts that all of Applicant’s claimed structural limitations have been accorded full weight by the Examiner as recited in this and the prior action. The Examiner’s statements as to intended use is directed only to claimed recitations identifying gas identities as being either “cleaning gas” or “processing gas”. Applicant’s arguments based on intended use in apparatus claims directs the Examiner to inquire if van Os’s apparatus could perform the intended use – in this case use either process gases or cleaning gases in his respective cleaning gas (column 4, lines 18-31) distribution channel (54, 56; Figure 4; column 7, lines 18-31)

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separate from the processing gas shower (15; Figure 1; column 3, lines 30-56). The Examiner has concluded that van Os's apparatus is capable of performing the intended use.

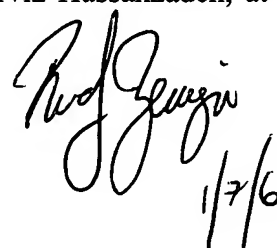
Conclusion

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

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7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Rudy Zervigon whose telephone number is (571) 272.1442. The examiner can normally be reached on a Monday through Thursday schedule from 8am through 7pm. The official fax phone number for the 1763 art unit is (703) 872-9306. Any Inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Chemical and Materials Engineering art unit receptionist at (571) 272-1700. If the examiner can not be reached please contact the examiner's supervisor, Parviz Hassanzadeh, at (571) 272-1435.

Handwritten signature of Rudy Zervigon and the date 1/7/6.